

## 256KXL MODS

### TOTAL XE COMPATABILITY

This mod will make the 256KXL upgrade control Antic banking the same as the 130XE. It will eliminate the need for manually controlling the two modes. All that is required is some wire and solder and do the following.

1. Desolder and remove U2. Cut traces to pins 7 of U2 (74LS151). Cut trace between pin 8 & 4. Cut trace between pins 13 & 14 and 14 & 15. Cut power trace to pin 1. Cut trace between pin 2 & 15 (under IC). Bend pins 9 & 10 up and reinstall 74LS151 in U2.
2. On U2, strap pin 1 to 15, 15 to 13 and 12 to 8 (ground). Strap pin 10 to PB4, pin 9 to PB5, and pin 7 to 8 (ground). Strap pin 3 to 14. Strap pin 2 to U5 (74LS02) pin 13.
3. Strap U1 (74LS158) pin 10 to U5 pin 12. Strap U1 pin 13 to U5 pins 8 & 9. Strap U5 pin 10 to 11.
4. Make sure you have the HALT line connected to Antic pin 9 and test computer. Run some software that you know requires XE type Antic banking.

### OPERATION:

PB4, PB5, and Antic control from U6 determine CPU banking enabling thru S1, S2, and S0 select inputs. Decoding A14 inverted thru one gate of U5 and tied to another gate along with A15 determine if we are addressing the banked memory area. If we are the output of U2 enables banking.

### BANKING ALL 256K

I designed the 256KXL to protect the main memory from banking. In other words, you can't bank any section of the main memory into the banked memory address range. This includes the ram under the OS. Because none of the other upgrades didn't do anything about this or the Antic for that matter, some software was designed to access the ram under the OS thru the \$4000-\$7FFF banked memory area for an additional 16K. I think PAPERCLIP does this.

Anyway, if you want to do the same thing, cut the trace from pin 1 of U5 to pin 12 of U3, and strap PB6 to U3 pin 12. On U3 cut trace between pins 13 & 14, and strap 13 to 8 (ground). This will allow access to all 256K. This will also change the physical banks that you look at, putting the main memory banks at 83(0-3FFF), 87(8000-DFFF), 8B(4000-7FFF), 8F(E000-FFFF) banking range. The page (low nibble) sequence (3,7,B,F) can be manipulated by swapping and/or inverting PB2 and/or PB3. You can use the 74LS02 in U5 to invert PB2 & PB3. The high nibble banking sequence will be 8 (main), A (banked), C (banked), and E (banked). If you do this mod, you will have to reconfigure your software for the new banking sequence.

Please do these mods one at a time. it will make it a lot easier to figure out if you mess up. I have finally tested these mods, and they do work. Hopefully there aren't typo errors. If you have any problems, you can call me at 214-442-2943 (voice) or 442-6612 (might get modem in evenings, page or leave note).

Wes Newell

## 256KXL INSTALLATION, 800/1200XL

**CAUTION:** This product should only be installed by persons with proper training in the art of soldering. Newell Industries will not be held responsible for damage to the computer due to neglect or carelessness.

**NOTE:** The ANTIC chip in location U7 should be part number CO21697-XX. If the ANTIC chip is CO12296, operation of the computer may be erratic if Antic DMA (screen) is turned off. Contact Newell Industries or your Atari service center for the proper Antic.

Read these instructions completely before beginning. Refer to drawing during installation.

1. Disassemble computer and remove the top RF shield.
2. Locate and remove the 64K ram chips. U9-U16 on the 800XL. U1-U6 and U8 and U9 on the 1200XL. If your ram chips are not in sockets, they will have to be unsoldered.
3. Install the 256K x 1 bit 150ns DRAM chips where you remove the old ram chips. Make sure that you have pin 1 in the proper location. Pin 1 of any chip is ALWAYS to the left of the notch that is at (what is referred to) the top of the chip.
4. Remove the resistor from R32 on the 800XL. It is the 3K resistor to the rear of ram socket U9. Remove resistor R30 on the 1200XL. It is the 3K resistor behind the ram chips.
5. Remove the 74LS158 or 74LS258 chip from U27 on the 800XL and install the 16 pin socket provided in U27 if one is not already present. On the 1200XL, remove the 74LS158 from U10.
6. Plug the 256KXL jumper plug into U27 of the 800XL. Plug the 256KXL into U10 on the 1200XL. Make sure that pin 1 is aligned.
7. Run the following jumper wires from the 256KXL board to the PIA chip (U23 in both the 800XL and 1200XL). PB2 to pin 12, PB3 to pin 13, PB4 to pin 14, PB5 to pin 15, and PB6 to pin 16. This may be done by running the jumpers to the bottom or top side of the motherboard.
8. Run jumper wire from 256KXL DEL to pin 9 of the 74LS51 in U30 (800XL), U25 (1200XL) (see drawing) and tack solder to this pin. Do not remove this pin and use extreme caution while soldering.
9. Run jumper wire from 256KXL HALT to feedthrough hole just behind the ANTIC chip in U7 (800XL), U20 (1200XL) (see drawing) that is common with pin 9 (halt) of the ANTIC chip, or tack solder to pin 9 of ANTIC. Do not remove pin 9. SEE NOTES.
10. Run jumper wire from 256KXL RA8 to the inside most hole (see drawing) of the R32 resistor pad (800XL) that is common with pin 1 of the ram chips and solder. On the 1200XL wire goes to R30 resistor pad closest to the front.
11. On the 1200XL, make the changes listed under 256KXL INSTALLATION, 1200XL ONLY.
12. Make sure that the 256KXL board is not shorting to anything and turn the computer on. If installation was done properly the computer should come up in the same manner that it did before this installation was done. If not, correct the problem (see trouble shooting) and try again.
13. When putting the computer back together, use extreme caution to make sure that the 256KXL board does not short out anything. You may want to use cardboard or electrical tape to insure this, especially if you move your computer around very much.

## 256KXL INSTALLATION, 1200XL ONLY

1. Cut trace to pin 3 of U7. Cut trace to pin 11 of U10. Cut trace to pin 13 of U10.
2. Install jumper wire from CPU address A7 to U10 pin 11. A7 is the trace that was going to U7 pin 3.
3. Install jumper wire from CPU address A13 to U7 pin 3. A13 is the trace that was going to U10 pin 13.
4. Install jumper wire from CPU address A14 to U10 pin 13. A14 is the trace that was going to U10 pin 11.

### Helpful hints:

If you have read these instructions and do not understand them, then do not attempt this installation without assistance. For assistance, you may call Newell Industries between 9 and 5 CT. Collect calls will not be accepted.

Plan the routing of the jumper wires before you start. You may be able to route the wires through the cartridge slot clip holes if you are going to route your jumpers to the bottom. If you feel that you cannot do the installation yourself, and cannot find anyone locally to do it, Newell Industries will install the upgrade for \$30.00 plus shipping.

If you have to desolder your ram chips, and you install sockets, make sure that the sockets that you use are high quality, preferably double side wipe (metal contacts the IC leads on both sides).

#### NOTES:

1. By installing a single pole double throw (SPDT) toggle switch on the halt line, you can manually select antic to follow main or banked memory when banking is enabled. Instead of connecting the halt from the 256KXL to antic, connect it to the center pole of the switch. Connect one side of the switch to antic pin 9. Connect the other side of the switch to +5 volts (use a 1 to 5K resistor in series to +5 volts if available, you can use the 3K resistor removed from R30 or R32). Now, depending on the position of the switch, antic will follow either main or banked memory. This switch will need to be installed and set for banked memory if using the 130XE version of TYPESETTER by XLENT Software. No other cases or known at this time.
2. Some of the 800XL computers have the data lines to the ram drilled and resistors installed across them. If so, the resistors must be left connected, or reconnected for proper operation.

#### TROUBLE SHOOTING

##### 1. BLANK SCREEN

This could be caused by numerous things. Check all ICs for bent pins. Check for shorts in soldering. To isolate problem, remove 256KXL board. Install the IC that was removed. Install the resistor that was removed and power up again. If problem is in 256KXL board, system should come up normally.

##### 2. MYDOS WILL NOT BOOT

Same as 3.

##### 3. ERROR MESSAGES DURING TEST RUN

Check HALT, DEL, RA8 to proper pins (see drawing). Check solder connections for bad solder joints or shorts. Check PB2-PB6 to proper pins.

##### 4. UNKNOWN

The chances of your having a defective 256KXL are less than 1 in 500. The most common cause for problems are improper installation. If you have double checked your installation and it still does not work, contact Newell Industries for further assistance.

#### WARRANTY

Newell Industries will repair or replace any defective part for a period of ninety days from date of purchase at no charge. This excludes parts that have been mishandled or modified in any way.

If you have installed the 256KXL upgrade in your computer and cannot get it to function properly, you may send your computer motherboard to Newell Industries and it will be repaired and returned to you at no charge if it is determined that the upgrade parts are defective. If improper installation is the cause of the failure, Newell Industries will correct the installation and return the tested board to you COD for charges.

#### USING YOUR 256K RAM

The 256KXL ram expansion provides 64K of direct memory plus 192K of bankable memory in 12 16K banks. The design of this upgrade is so that software designed for the 130XE computer should now load and run on the computer.

Location \$D301, the bit map;

BIT 0-O.S. ROM CONTROL, 1=ROM, 0=RAM  
BIT 1-BASIC ROM CONTROL, 1=RAM, 0=ROM; NOT USED IN 1200XL  
BIT 2-RAM BANK SELECT, 1=RAM, 0=RAM, SEE NOTE  
BIT 3-RAM BANK SELECT, 1=RAM, 0=RAM, SEE NOTE  
BIT 4-RAM BANK ENABLE, 1=NOT ENABLED, 0=ENABLED  
BIT 5-RAM BANK SELECT, 1=RAM, 0=RAM, SEE NOTE  
BIT 6-RAM BANK SELECT, 1=RAM, 0=RAM, SEE NOTE  
BIT 7-DIA.ROM CONTROL, 1=RAM, 0=ROM

NOTE: Bits 2,3,5, and 6 have no effect unless bit 4 is 0 (enabled). The bank memory address is \$4000-\$7FFF.

The function of location \$D301 is the same as the 130XE with the exception of bits 5 and 6. Bit 5 on the 130XE allows ANTIC to follow banked memory if set to 0. With the display up above the memory banks anyway, this feature is

actually not very useful unless you have some special applications. (SEE NOTES)  
With the 256KXL expansion, ANTIC follows the main memory. This insures that  
your display will never be garbaged by banking. Bit 6 is not used on the  
130XE.

#### BIT 4- THE CONTROL BIT

The computer never sees the extra memory unless bit 4 is set to 0. Once  
this is done the computer is looking at the extra memory determined by the  
setting of bits 2,3,5,6. As long as bit 4 is set to 0, the CPU looks at extra  
memory.

REFERENCE VALUES (stored in location \$D301):

FF=standard ram, basic disabled

EF=extra ram, EB=another bank, E7=another bank, E3=another bank.

CF=another bank, CB=another bank, C7=another bank, C3=another bank.

8F=another bank, 8B=another bank, 87=another bank, 83=last bank.

NOTE: AF,AB,A7,A3 in memory location D301 has the same effect as EF,EB,E7,E3  
respectively.

There is a simple program that checks one byte of each bank of memory to  
insure that they are working. It is on the disk furnished. The filename is  
"TEST256K.BAS". When this program is ran, it should come back with "TEST  
COMPLETED". If you get any ERROR messages back, refer to the trouble shooting  
section. CAUTION, reboot your system after running this program. It alters  
memory, and may have some undesirable affects if the system is not rebooted.

#### MYDOS DISK OPERATING SYSTEM

The MYDOS disk operating system is furnished with the 256KXL upgrade.  
Refer to the Mydos manual for setting up the various types of ramdisks  
available.

#### SPARTA DOS

The ramdisk file RD.COM of Sparta DOS was written for the ICD upgrade. To  
take full advantage of the ramdisk memory using Sparta DOS, the byte table of  
RD.COM must be patched in the following manner.

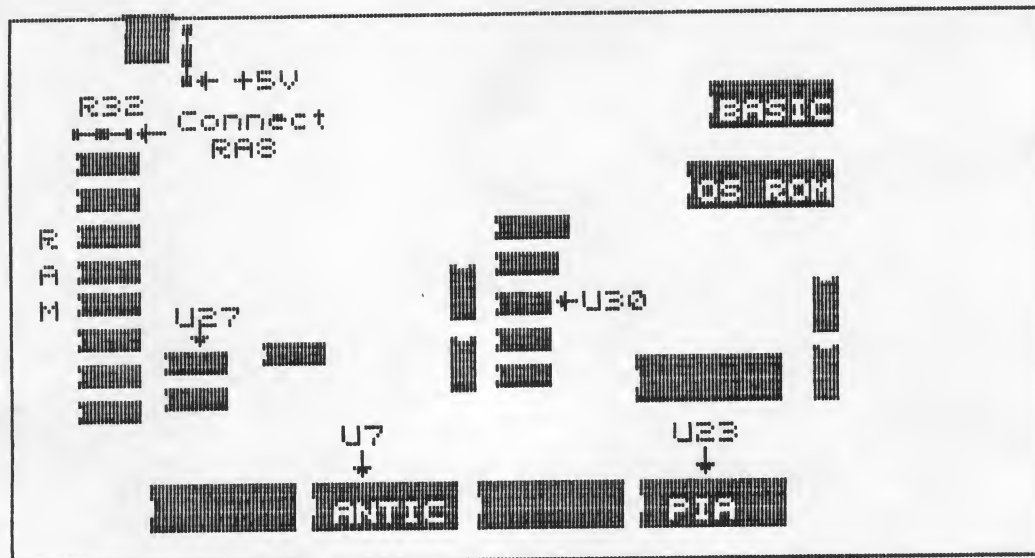
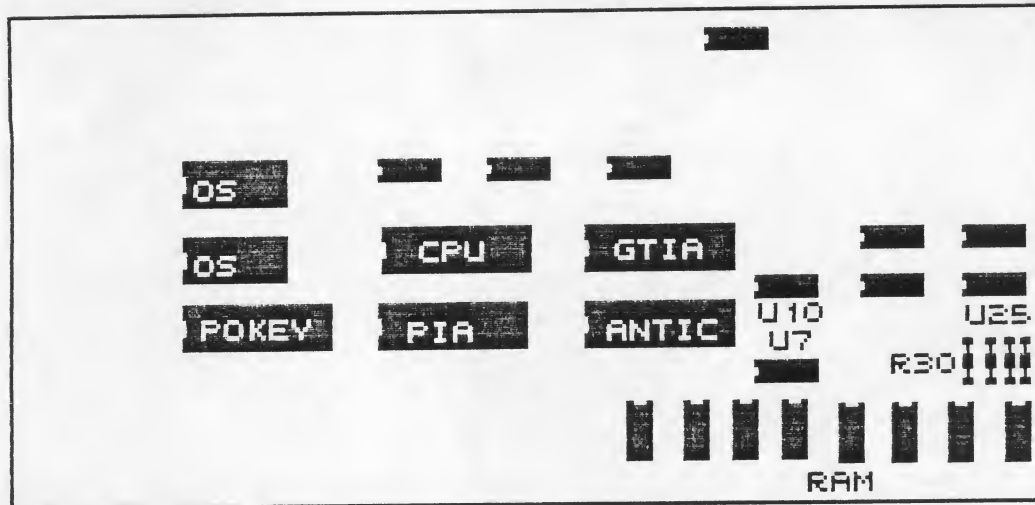
Change the byte sequence '60 64 68 6C 20 24 28 2C 40 44 48 4C 00 04 08 0C' to  
'60 64 68 6C 40 44 48 4C 00 04 08 0C 20 24 28 2C'.

#### PAPER CLIP

Several versions of Paper Clip are out. If your version does not support  
the memory upgrade, search for the sequence 'FE FE E2 E6 EA EE A2 A6 AA AE C2  
C6 CA CE 82 86 8A 8E' and change it to 'FE FE E2 E6 EA EE 82 86 8A 8E C2 C6 CA  
CE A2 A6 AA AE'.

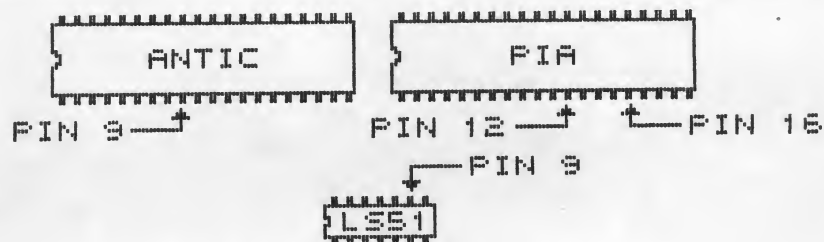


## 1200 XL GENERAL LAYOUT



## 800 XL GENERAL LAYOUT

### TYPICAL IC PIN LAYOUT



### DETAILED PINOUT